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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,929	10/30/2003	Scott R. Bickham	SP03-145	8229
22928	7590	02/24/2005	EXAMINER	
CORNING INCORPORATED			STAHL, MICHAEL J	
SP-TI-3-1			ART UNIT	PAPER NUMBER
CORNING, NY 14831			2874	

DATE MAILED: 02/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

A

Office Action Summary	Application No.		Applicant(s)	
	10/696,929		BICKHAM, SCOTT R.	
	Examiner		Art Unit	
	Mike Stahl		2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19 and 20 is/are allowed.
- 6) ☒ Claim(s) 1-7, 9, 13 and 15-17 is/are rejected.
- 7) ☒ Claim(s) 8, 10-12, 14 and 18 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/30/03, 12/1/03.</u> | 6) <input type="checkbox"/> Other: ____. |

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-7, 13, and 15-17 are rejected under 35 U.S.C. 102(a) as being anticipated by Aikawa et al. (US 2003/0095769).

Claim 1: Aikawa discloses in fig. 1B and example D of Table 1 a dispersion compensating fiber with a refractive index profile having a central core segment having a positive relative refractive index Δ_1 and a core outer radius r_1 , a moat segment surrounding the central core segment and having negative relative index Δ_2 and a moat outer radius r_2 , and a ring segment surrounding the moat segment and having a positive relative index Δ_3 and a ring center radius r_3 to a center of the ring segment; wherein the refractive index profile yields a total dispersion between -114 and -143 ps/nm/km at 1550 nm (specifically, -131 ps/nm/km), and a kappa value between 96 and 150 nm (specifically, 117 nm).

Claims 2-3: The kappa value at 1550 nm for example D falls within the ranges recited by both claims.

Claim 4: The dispersion slope at 1550 nm for example D is between -0.7 and -1.5 ps/nm²/km (specifically, -1.12 ps/nm²/km).

Claims 5-6: The total dispersion at 1550 nm for example D falls within the ranges recited by both claims.

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Claim 7: The fiber of example D may be incorporated into a dispersion compensating module ([0061]).

Claim 13: The core/moat ratio is greater than 0.32 (specifically, $a/b = 0.38$).

Claim 15: Δ_1 is between 1.0 and 2.0 % (specifically, 1.54 %).

Claim 16: Δ_2 is less than -0.3 % (specifically, -0.94 %)

Claim 17: Δ_3 is greater than 0.3 % (specifically, 0.34 %)

Claims 1-2, 4-7, 9, 13, and 15-17 are rejected under 35 U.S.C. 102(a) as being anticipated by Saitou et al. (US 2002/0164139).

Claim 1: Saitou discloses in figs. 12A and 12B a dispersion compensating fiber with a refractive index profile having a central core segment having a positive relative refractive index Δ_1 and a core outer radius r_1 , a moat segment surrounding the central core segment and having negative relative index Δ_2 and a moat outer radius r_2 , and a ring segment surrounding the moat segment and having a positive relative index Δ_3 and a ring center radius r_3 to a center of the ring segment; wherein the refractive index profile yields a total dispersion between -114 and -143 ps/nm/km at 1550 nm (specifically, -130.5 ps/nm/km), and a kappa value between 96 and 150 nm (specifically, 130.5 nm).

Claim 2: The kappa value at 1550 nm falls within the recited range.

Claim 4: The dispersion slope at 1550 nm is between -0.7 and -1.5 ps/nm²/km (specifically, -1.00 ps/nm²/km).

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Claims 5-6: The total dispersion at 1550 nm falls within the ranges recited by both claims.

Claim 7: The fiber may be incorporated into a dispersion compensating module ([0200]).

Claim 9: Aikawa discloses an optical fiber transmission system using the fiber of figs. 12A-12B optically coupled with a single mode transmission fiber having a total dispersion between 5 and 14 ps/nm/km at 1550 nm ([0192]-[0200] and figs. 13A-13B). As described in part at [0197] and shown in fig. 13A and the magnified dispersion axis of fig. 13B, the residual dispersion for all wavelengths between 1525 and 1625 nm has a magnitude less than 20 ps/nm per 100 km (i.e. 0.2 ps/nm/km) of the transmission fiber. It is understood that fig. 13B would look the same if the respective lengths of the fibers ([0193]-[0194]) were scaled up such that the single mode fiber 1 is 100 km long, i.e. by using 100 km of that fiber and 7.5 km of the dispersion compensating fiber.

Claim 13: The core/moat ratio is greater than 0.32 (specifically, $r_1/r_2 = 1.53/3.98 = 0.38$).

Claim 15: Δ_1 is between 1.0 and 2.0 % (specifically, 1.62 %).

Claim 16: Δ_2 is less than -0.3 % (specifically, -0.94 %)

Claim 17: Δ_3 is greater than 0.3 % (specifically, 0.34 %)

Allowable Subject Matter

Claims 19 and 20 are allowed. Claims 8, 10-12, 14, and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Claim 8 requires that the residual dispersion of the transmission system has a magnitude of less than 10 ps/nm per 100 km (i.e. 0.1 ps/nm/km) of the single mode transmission fiber over the specific wavelength range of 1525 to 1565 nm. Saitou et al. is the closest applied reference in this regard. Fig. 13B shows a residual dispersion close to this range, but somewhat above 0.1 ps/nm/km at 1565 nm and somewhat below -0.1 ps/nm/km at 1525 nm. Thus Saitou fails to disclose or suggest a transmission system which meets the limitations of claim 8.

Claims 10, 19 and 20 each require that the central core segment has a radius of between 1.6 and 1.8 microns. The central core segment radius in the exemplary embodiments as applied above is 1.53 microns in Saitou et al. and 1.59 microns in Aikawa et al. These were the only embodiments which met the dispersion and dispersion slope requirements of claims 1, 19, and 20. There is no suggestion in either reference to specifically use a central core segment radius within the claimed range, or that doing so could yield a fiber which still satisfies the recited dispersion and dispersion slope characteristics. Claim 11 depends from claim 10.

Claim 12 requires that the ring segment is offset from the moat outer radius by more than 0.75 microns (see e.g. fig. 4 of the present application). The applied references fail to disclose or suggest any offset of the ring segment from the moat outer radius.

Claim 14 requires that the effective area at 1550 nm is greater than $15 \mu\text{m}^2$. The effective area of the fiber embodiments as applied above is $13.9 \mu\text{m}^2$ in Saitou et al. and $15 \mu\text{m}^2$ in Aikawa et al. Neither reference teaches or suggests providing the dispersion compensating fiber with an effective area which is specifically greater than $15 \mu\text{m}^2$ while still maintaining dispersive properties which fall within the ranges of base claim 1.

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Claim 18 requires that the half-height width of the ring segment is between 1 and 2 microns. For the exemplary embodiments as applied above, the ring width is 3.07 microns in Saitou et al. and 3.18 microns in Aikawa et al. Both ring widths are well outside the range of claim 18, and neither reference discloses or suggests altering the ring width of the dispersion compensating fiber to satisfy the range of claim 18 while still maintaining the dispersive properties of base claim 1.

Conclusion

The following additional references listed on the attached PTO-892 form are considered relevant. US 6574407 and US 6668120 disclose dispersion compensating fibers having parameters similar to those claimed (especially example T2 of '407 and example 5 of '120). US 6396987 is one of the references mentioned in the specification (p. 16). It is noted that the information disclosure statement filed October 30 2003 listed a reference number as 6376987, which is believed to be a typographical error.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Stahl at 571-272-2360. Inquiries of a general or clerical nature (e.g., a request for a missing form or paper, etc.) should be directed to the technical support staff supervisor at 571-272-1626. Official communications which are eligible for submission by facsimile and which pertain to this application may be faxed to 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application

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Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJS

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February 21, 2005



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